

SI 669 - Developing the Mobile Experience

Course Syllabus

Fall 2023 Semester
University of Michigan School of Information

This syllabus is all potentially subject to change over the course of the semester. Any substantial changes to it will also be announced.

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Instructor

Instructor: Mark W. Newman, Professor of Information and EECS

Email: mwnewman@umich.edu (communication via Slack is preferred)

Class Meetings: Thursdays, 1-3:50pm, G550 DENT (Dentistry building)

Office Hours: See Mark's [bookable office hours calendar](#) to book a 15 minute slot.

Generally office hours will be held on Friday afternoons. However, these may shift on some weeks due to conflicts and the like, so be sure to check the calendar to see what's available. If you don't see anything available that works for you (if all slots are booked, you won't see anything), feel free to reach out to me via Slack DM to try to find an alternate time.

Course Description

This course will introduce you to developing mobile applications that take advantage of uniquely mobile features, such as geolocation, cameras, and notifications. In the 2023 offering of the course, you will gain a solid understanding of building applications using React Native and Firebase, as well as how to use standard testing and debugging tools to find and fix software bugs. You will also receive a general overview of other mobile app development approaches.

The course is intended to be programming-intensive. In other words, the emphasis will be more on the "Developing" than the "Experience", though we will talk about what makes the "Mobile Experience" different from other kinds of interactive experiences, and use that knowledge in the things that we build.

Learning goals

- Competency: **Build a Minimally Viable Prototype** of a complete mobile app, including native components (e.g., camera, geolocation), UI, and a backend using React Native and Firebase.
- Competency: Use state of the art **tools for developing and testing** mobile applications.
- Literacy: Argue effectively for the **strengths and weaknesses of different mobile development approaches**, including responsive web design, platform independent frameworks, and native components.
- Literacy: Understand the **mobile app ecosystem**, including Native APIs, App Stores, beta testing tools, push notifications, and mobile app UIs.

Required prerequisites

506, 507 or 579, and 539 (or waivers thereof)

Beneficial prior courses and experience

664, 582, Any additional experience with JavaScript and/or application development on any platform.

Exceptions to prerequisites

The purpose of the prerequisites is to make sure that you are ready to dive into a new development platform with enough confidence and programming proficiency to be able to pick up new ideas and approaches quickly, and be able to troubleshoot problems you encounter, including searching for solutions online and in platform documentation. The primary language used in the course will be JavaScript, so you are expected to have or be able to rapidly acquire a good grasp of how to read and write JavaScript programs. You will need to have a basic understanding of how HTML/XML, CSS, and JavaScript work together, and will need to be able to use HTML/XML templates to render dynamic content.

If you haven't taken the prerequisites, but feel that you have the background to succeed in this course, I am open to waiving the prereqs. Be advised, though, that the teaching team (i.e., I) will not have the capacity to fill in gaps in the expected prerequisite knowledge and skills. Please note also that if you are planning to take the User-Centered Agile Development mastery course you will need to satisfy all of those prerequisites (whether by taking the course or a formal waiver), even if you are allowed take 669 despite missing prereqs.

Required Resources

There is no textbook for this course. As far as I know there does not exist a textbook (or, more generally, a book) that introduces mobile app development (in React Native or any other platform) at a level that would be appropriate for intermediate programmers. I am striving to develop the course Lecture Notes in a way that is approximately as self-contained and complete as a textbook would be. Perhaps some day these will evolve into a textbook that can be shared with others, but for now they are a work in progress. Course readings and resources linked to the Lecture Notes will all be freely available on the web.

You will need to have access to an Android or iOS smartphone. Ideally this would be your own phone, but need not be, as long as you can gain frictionless access to the phone for testing. If you do not have access to a reliable smartphone please let me know as soon as possible so that we can find a solution.

You will also need a laptop or desktop computer for development, with administrator access for installing tools. Windows, MacOS, and Linux will all work and I will do my best to support all of these platforms. You will be expected to have your laptop during class meetings, as coding exercises and code-alongs will be frequent during lectures. If you do not have a working laptop (either now or in the future), please contact [ITS](#) to work out a solution (e.g., a loaner laptop or some other arrangement).

Class Interactions

In Fall 2023, the primary form of class interaction will be *in person!!!* At least, that will be the case as long as it is reasonable to do so. In SI 669 we will follow all University policies regarding in-person interactions (see “COVID-19 Related Policies for Fall 2023” below), including relevant masking, social distancing, and quarantining guidelines. Due to the ongoing disruptions caused by the COVID-19 pandemic, all relevant course materials (including lecture recordings) will be made available for remote interaction, with the understanding that some students may be unable to participate synchronously or in person for periods of time.

There will be no attendance recorded or required at class meetings, however attendance is *expected* unless there is a legitimate reason (illness or unavoidable travel) to be absent. The quality of in-person learning is considerably greater than asynchronous/remote. Also, having a vibrant, committed class *community* benefits all students. The course is more than the content!

Class Meetings

Time and Place: Thursdays, 1-3:50pm, G550 DENT (Dentistry building)

Duration of Course: The class meets every Thursday from Aug. 31 - Dec. 7 (inclusive), with the exception of Thursday, Nov. 23 (American Thanksgiving). The final assignment deadline will be Friday, December 15. Non-lecture class interactions such as office hours and Slack will continue until December 15.

Preparing for class: You are expected to complete each week’s readings and pre-class preparation before lecture. Lectures will often contain material and examples not present in the readings. Homework exercises are to be completed outside of the class meeting, though sometimes there may be time to work on them in class if we finish early.

Class meeting structure: Class meetings will take place in G550 DENT. Class meetings will combine lecture, demonstrations, discussion, and hands-on exercises, in varying combinations depending on the week and topic. You should bring a laptop and mobile phone to every class so that you can participate in class activities.

Office Hours

Individual Office Hours. I will hold mostly regular individual office hours, mostly on Friday afternoons 2-3pm . You should book a 15 minute slot in advance (even if it's a few minutes in advance) via my [bookable office hours calendar](#). Please only book one 15 minute slot if you are booking more than a day in advance. If there are still slots available on the day of office hours you can go ahead and grab a second 15 minutes slot. You can also team up with other classmates if you have similar questions.

Canvas

Canvas will be the central location for everything in the class. You'll find all announcements, readings, videos, assignments, zoom links, and lecture notes there, along with links to your gradebook, and anything else I'm forgetting to mention.

Modules. Nearly everything you need to do in this course can be found in the Modules section of Canvas. All of the prep for each week, the class meeting link and lecture notes, and assignments can be accessed via the relevant module. There is a module for each week. Plus, you can help your grade by completing everything in each module.

Assignments. All assignments, including quizzes, labs/homeworks, and projects will be accessible via the Canvas site. They can be accessed through the Assignments section as well as the Modules--they will be added to the relevant Modules when they are released as well as when they are due. All grades will be available on the Canvas site. We will try our best to grade assignments as quickly as possible.

Announcements. General announcements about course scheduling changes, clarifications, important upcoming events, etc. will occur via Canvas Announcements. You should make sure your Canvas settings are set up so that you *will* receive email from Canvas Announcements for this course. You will be expected to have received information sent via Canvas Announcements. (The default Canvas settings will have you getting that email, but if you turned Canvas emails off, make sure you turn 'em back on or ask someone to figure out how to do so.)

Slack

For communication outside of class, including questions about course content, assignments, and the like, we will use the SI669-F23 Slack workspace. Slack allows for threaded conversations, which works well for discussions about particular topics such as "what does this mean?" and "how do I do this?" You should have been automatically added to the workspace based on your membership in the Canvas site (which is based on your registration in Wolverine Access). If this isn't the case, please contact me. I strongly recommend downloading the Slack client for your platform (Mac/Windows) and keeping it running so that you can receive

notifications and monitor discussions. You may want to also install the Slack mobile app so that you don't miss anything ever!

Feedback

The teaching team would love your feedback at any time on how the course is going for you. Comments can be submitted anonymously, or you can add your name and email address if you'd like a response. The "Anonymous" Feedback link in the "Pinned" Module in Canvas will be available all semester, and we will monitor responses on a regular basis.

Grading Questions and Concerns

For questions or concerns about grades/scores ("when will my Project 2 be graded?" "I think I got an incorrect score on problem 3", etc), please **submit your concern** via the "Grading Concerns" form, which is available via the "Pinned" Module in Canvas. We will address those questions by responding to you via email, as soon as possible, but perhaps not immediately.

Email

For questions not related to course material, e.g. questions about extensions or personal circumstances, but NOT about regrades, please email the instructor directly.

If you email me directly, I *can not* guarantee that you will get an email back within any particular time period, but I will try my best to do so. In general, I should be able to reply within 24 hours during the week. Weekends are pretty hit-or-miss, but I will usually reply on Monday if I didn't get back to you over the weekend. If you have not received a response after 3 days or so, it's reasonable to send a follow-up to make sure your request did not slip through the cracks.

Assignments and Grading

There are five components of the course. Your performance on those five components will determine your grade.

Course Component	Points	Percentage of Final Grade
"Participation"	300	10%
Demonstrate Your Understanding (quizzes)	600	20%
Homeworks	600	20%
Projects 1-2	600	20%

Final Project	900	30%
Total	3000	100%

“Participation”

There are four ways to earn participation points in SI 669:

1. About Me Slide (50 points): Complete a slide introducing yourself to the class.
2. About Me Questionnaire (50 points): Complete a brief questionnaire introducing yourself to me (Mark).
3. App of the Week (100 points): Potentially with a partner, you will complete and present a brief review of an existing app. You'll sign up for a slot early in the semester and give a short (<5 minute) presentation during one of the class meetings later on.
4. Canvas Modules (100 points): There are 12 modules, and you will earn 10 points for each module that you “complete” in Canvas. Since the maximum number of points you can earn for this task is 100, you can skip two modules and still earn full credit.

Demonstrate Your Understanding

Demonstrate Your Understanding (DYU) assignments are online quizzes that are designed to make sure that you understand the key points that were covered in particular course lessons. DYUs are open notes, open browser, open editor, self-paced, untimed, and can be taken multiple times. Your best score before the due date will be your score.

There will be 4 DYU quizzes, each worth 150 points.

DYUs will be completed individually. See the section “Academic Integrity & Collaboration” below for more details on acceptable forms of peer support and collaboration for individual work.

Homeworks

There will be homework exercises assigned throughout the semester on a more-or-less biweekly basis. Homework exercises will be mini-projects, where you are asked to write code to meet specified criteria. Homeworks are designed to be completable with 2-5 hours of work. Some Homeworks may offer the opportunity to earn extra credit. Usually the extra credit is much more challenging than the “basic” assignment and is intended for people who want to push their skills to the next level.

There will be 5 homeworks, each worth 120 points. Homeworks will be completed individually. See the section “Academic Integrity & Collaboration” below for more details on acceptable forms of peer support and collaboration for individual work.

Projects 1-2

You will complete two highly specified projects in this course. Each project will require you to create a React Native app more or less from scratch, though you will be able to incorporate code from homeworks and lectures into your projects in some cases. These projects will be done individually and each will be worth 300 points.

Projects 1-2 will be completed individually. See the section “Academic Integrity & Collaboration” below for more details on acceptable forms of peer support and collaboration for individual work.

Final Project

For the final project you will design and build an app of your own choosing, with some constraints and requirements. You can complete the final project alone or with one or two other students (max group size = 3). There will be several stages of the final project, each worth different points, with all of the components adding up to 900 points. The stages will include

- Project Proposal (100 points)
- Project Plan (100 points)
- Checkpoint #1 (100 points)
- Checkpoint #2 (100 points)
- Final Presentation & Demo video (300 points)
- Project repo (200 points)

The Final project can be completed as an individual or in a group with size 2 or 3. In other words, Final Project Groups can include 1-3 people.

Letter Grades

Your final grade in the course will be based on the weighted percentage of your grades across each component. Due to extra credit, it's possible to get more than 100%.

A+	>99 %
A	94-98.99%
A-	90-93.99%
B+	87-89.99%
B	83-86.99%
B-	80-82.99%
C+	77-79.99%
C	73-76.99%

C-	70-72.99%
D+	67-69.99%
D	63-66.99%
D-	60-62.99%
E/F	0-59.99%

The cutoffs between letter grades are hard cutoffs. Even if you missed a cutoff by a few tenths of a percentage point, please do not ask to be bumped up a level. If you feel you have been graded unfairly on a particular assignment, you may submit a regrade request, following the process described in "Communication."

Late Policy, Extensions, and Excused Absences

Any assignment may be submitted up to 4 days late, at a deduction of 10% per day after the deadline.

Things come up. I understand that not everyone will be able to get everything done on time and there may be reasons why an assignment needs to be turned in a bit late. Here are the policies regarding late assignments:

- Late assignments will be assessed a 10% penalty for each day that they are late. Assignments that are more than four days late will not be accepted.
 - Note that the penalty is calculated based on the number of points available, not on the number of points awarded. So, for example, if an assignment that earned 88 out of 100 available points is turned in 46 hours late, the points awarded would be $88-20=68$.
- To spell it out:
 - Before the deadline: No penalty
 - 0:01-24:00 hours after the deadline: 10% off
 - 24:01-48:00 hours after the deadline: 20% off
 - 48:01-72:00 hours after the deadline: 30% off
 - 72:01-96:00 hours after the deadline: 40% off
 - > 96 hours after the deadline: 100% off

We reserve the right to change this with advance notice (e.g. if we will use the solution to an assignment in an upcoming lecture that is less than 4 days away). We will let you know about this with as much notice as possible.

Canvas will show you when your assignment is late -- it's any time after the deadline! Yes, even ten minutes. Gotta draw the line somewhere. However, if there's a good reason...

Extensions and Excused Absences

In order to maintain as much fairness as possible in this course, except in extraordinary circumstances, I do not generally give extensions or excuse assignments in this course.

Extensions and excused assignments may be granted for extreme personal circumstances only. "Extreme personal circumstances" include illness, family emergencies, and significant emotional distress (in this case, please also see "Student Well-Being" section). The legitimacy of each specific instance is at the discretion of the instructor. "Legitimate reasons" do not include awesome parties, family trips, or excessive course-related or extracurricular work—you are expected to plan ahead to meet your deadlines in all classes.

If extreme personal circumstances occur and you believe you need an extension, make a request to the instructor via email for the extension **as early as possible** and you will receive a response as soon as I can get back to you.

Religious holidays you observe that do not accord with the university's holiday schedule are, per university policy, always excused absences. If a holiday will take you away from class (a class meeting), please speak with the instructor in advance to find a time to make up for any content you miss.

For other accommodations you need to take this course, please see the section on **Accommodations for Students with Disabilities**.

Academic Integrity & Collaboration

Collaboration

UMSI strongly encourages collaboration while working on some assignments, such as homework problems and interpreting reading assignments as a general practice. Active learning is effective. Collaboration with other students in the course will be especially valuable in summarizing the reading, lecture, and discussion materials and picking out the key concepts. Collaboration will also be valuable in interpreting programming problems and identifying high-level solutions. You must, however, write your homework submission on your own, in your own words/code, before turning it in. If you worked with someone on the homework before writing it, you must list any and all collaborators on your written submission (or in comments for coding assignments). Each course and each instructor may place restrictions on collaboration for any or all assignments. Read the instructions carefully and request clarification about collaboration when in doubt. Collaboration is almost always forbidden for take-home and in-class exams.

Plagiarism

See the MSI/MHI student handbook available on the [UMSI Current Students webpage](#) for the definition of plagiarism, resources to help you avoid it, and the consequences for intentional or unintentional plagiarism. In 669 as in all courses you are expected to know what plagiarism is and to avoid it.

To provide more course-specific guidance: For individual assignments, including homeworks, projects, and DYUs, you may discuss the assignments and high-level solution approaches with other students (or other people in general), but you may NOT copy answers, text, non-public images, or code from another person, nor may you provide answers, text, images, or code to any other student. For group assignments, including App of the Week and the Final Project, you may interact with and share within your group, but interactions with people outside your group should conform to the policies governing individual work.

Search and Generative AI

For code, you are encouraged to search for and adapt examples you find online. You must, however, cite any resources you adapted (i.e. copied and modified from), including link(s) to the original(s).

Emerging generative AI tools can be useful in life and this class. Using generative AI in course activities and assignments is permitted, unless indicated otherwise. If you use generative AI in assignments, you must capture and turn in the full transcript of your interaction with the tool(s) you use. This will help me understand your thought process and how you transformed the tool output, while also helping me understand the emerging capabilities of tools in this area. If you're interested in generative AI for app development, I'd love to learn what you learn!

When using generative AI, You should exercise caution. Generative AI tools don't always get it right, and, in the case of code, can introduce errors that are difficult to anticipate or notice. You are responsible for all of the code and other materials you turn in (e.g., proposals, designs, descriptions, slides), and must be able to understand, explain, debug, and warrant anything you submit as "your work." This is a general principle for professional conduct, by the way, not simply a policy for this course. But it is also a policy for this course.

Accommodations for Students with Disabilities

If you think you need accommodations for a disability, please let me know at your earliest convenience. Some aspects of this course, the assignments, the in-class activities, and the way I teach may be modified to facilitate your participation and progress. As soon as you make me aware of your needs, we can work with the Office of Services for Students with Disabilities

(SSD) to help us determine appropriate accommodations. SSD (734-763-3000; <http://ssd.umich.edu/>) typically recommends accommodations through a Verified Individualized Services and Accommodations (VISA) form. I will treat any information that you provide in as confidential a manner as possible.

Student Well-Being

Students may experience stressors that can impact both their academic experience and their personal well-being. These may include academic pressure and challenges associated with relationships, mental health, alcohol or other drugs, identities, finances, etc.

If you are experiencing concerns, seeking help is a courageous thing to do for yourself and those who care about you. If the source of your stressors is academic, please contact me so that we can find solutions together. For personal concerns, U-M offers many resources, some of which are listed at [Resources for Student Well-being](#) on the Well-being for U-M Students website. You can also search for additional resources on that website. The School of Information also has an Embedded Psychologist, Ashley Evaritt, Psy.D., who you can contact at evaritt@umich.edu.